BLACK STORM-PETREL (*Oceanodroma melania*)

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Criteria Scores

Population Trend	Range Trend	Population Size	Range Size	Endemism	Population Concentration	Threats
0	10	10	10	2.5	10	5

Special Concern Priority

Not currently nor previously considered a Bird Species of Special Concern. However, given that both Fork-tailed Storm-Petrel (*Oceanodroma furcata*) and Ashy Storm-Petrel (*O. homochroa*) are so listed, to be consistent, this species should be included. Ashy Storm-Petrel in the State is much more abundant (many thousands) and breeding localities are widely distributed (Ainley 1995). In contrast, fewer than 150 pairs of Black Storm-Petrel nest in the State, and do so for sure at only two sites. The Black Storm-Petrel is analogous in status to the Fork-tailed Storm-Petrel. In the State, both are at the extreme peripheries of their respective ranges and nest in just a few localities; both occur inshore relative to other storm-petrel species and thus are subject to similar ecological pressures. As the California Current warms (e.g., McGowan et al. 1998), the Fork-tailed (a subarctic species) 'should' be decreasing and retreating northward (out of the State); and the Black Storm-Petrel, a subtropical species, 'should' be increasing and expanding northward in accord with several other subtropical coastal seabirds (Ainley and Divoky 2001). The species is becoming more abundant in offshore waters farther north in the State (Ainley et al. 1995, Hyrenbach 2000), but it is not colonizing new sites nor increasing at existing ones. Perhaps this is due to the fact that what would be suitable

breeding sites have been compromised by anthropogenic factors (developed, predators introduced, etc.).

Breeding Bird Survey Statistics for California

Not a species considered in the BBS.

General Range and Abundance

Nests on islands of southern (Alta) California and Baja California, Mexico (Everett and Ainley 2001). Likely has been extirpated, along with other burrowing seabirds, from a number of islands within its current range as a result of predation by introduced mammals (see Threats). Breeding population currently centered at Islas San Benitos (central Baja California), where large numbers nest. In southern (Alta) California, definitely breeds but in small numbers on two islands and possibly on three others (see below for details).

At sea, occurs northward in numbers along the coast to 39^{o} N off northern California (Pt. Arena), south to 15^{o} S off southern Peru, including Gulf of California, Gulf of Panama and Gulf of Guayaquil (Everett and Ainley 2001). Frequents waters of the shelf, shelf break and continental slope (100-3,000 m deep). Present in the northern part of its range (central California) late spring to winter, mainly autumn; highest numbers occur off California when warm waters intrude farther north than usual (e.g. El Niño; Everett and Ainley 2001).

Seasonal Status in California

Occurs year round in waters overlying the continental shelf off southern California. Numbers in waters off Alta California reach many thousands during fall as a result of northward movements of birds from breeding sties in Baja California. First visits to Alta California nesting colonies occur mid-April at Islas Los Coronados (near San Diego) and

late April at Santa Barbara Island (off Los Angeles). At Los Coronados (where most intensively studied), egg laying occurs from mid-May (earliest 12 May) to first week of August, with majority of eggs laid before mid-June. First chicks to hatch depart Islas Los Coronados late August-early September; last ones depart probably October (Everett and Ainley 2001).

Historical Range and Abundance in California

Known to have bred at Santa Barbara Island and the offshore rock, Sutil Island; possibly has bred or breeds among the other California Channel Islands (individuals captured in mist nets or found dead during nesting season): Prince, Anacapa, and San Clemente islands (Howell 1917, Hunt et al. 1980, Carter et al. 1992). Likely once bred on all the Channel Islands before the arrival of European humans (see below).

Recent Range and Abundance in California

Population limited at Islas Los Coronados by availability of suitable nesting habitat free of introduced cats, rats and other mammalian predators. This likely true from the larger perspective of the entire population considering all used and potentially used nesting localities. Overall, Alta and Baja California breeding population numbers in the hundreds of thousands to low millions of pairs (Everett and Ainley 2001). Most recent estimates for California breeding populations as follows: Islas Los Coronados — 250 pair in 1968 (DeLong and Crossin 1970), 100 pair in 1989-90 (Everett 1991); Sutil Island — 10-15 pair in 1975-77 (Hunt et al. 1980), 37 (range 12-62) pair in 1991 (Carter et al. 1992); Santa Barbara Island — 75 pair in 1975-77 (Hunt et al. 1980), 100 pair in 1991 (Carter et al. 1992).

Since 1980, numbers seen at sea in vicinity of Islas Los Coronados have declined (Everett and Anderson 1991). No similar data exist for other local areas. Owing to introduction of predatory mammals to breeding islands, world population now likely much smaller than before Europeans arrived. Endemic Channel Island Fox (*Urocyon littoralis*) and Island Spotted Skunk (*Spilogale gracilis*) could have limited presence from all of the Channel Islands except Santa Barbara and Sutil Islands during prehistoric times. However, on all islands some habitat exists that would have been inaccessible to these predators (Hunt et al. 1980, McChesney and Tershey 1998).

Ecological Requirements

Like other small, cavity-nesting seabirds, needs habitat free of mammalian predators, hence offshore islands, on which to breed. Nests in cavities, but does not excavate burrows. Therefore, needs rocky talus, with rocks large enough to afford spaces between that are not large enough to allow access by competitors, such as Cassin's Auklet

(*Ptychoramphus aleuticus*). Readily shares crevices with other storm-petrel species, and sequentially replaces the earlier-breeding Xantus' Murrelet (*Synthliboramphus hypoleucas*) in the same crevices. Brush and cactus may afford some protection from predation by owls (Everett and Ainley 2001).

Threats

Like other storm-petrels, likely vulnerable to oil spills (Butler et al. 1988) and pesticides (Nisbet 1994), but no direct data on this subject exist for this species. Storm-petrels readily ingest plastic particles floating on the sea, and for some species this can lead to, at the least, a decrease in body condition (Spear et al. 1995). No direct data on this subject exist for this species.

Pre-historically, true of almost all seabirds, population likely was limited by availability of predator-free islands; pattern for this species were further exacerbated during historical times by introductions of cats, rats, dogs, and pigs, e.g. Islas Los Coronados and Santa Barbara Island. Fishermen and seafarers introduced these animals at unknown times, sometimes inadvertently and sometimes as a source of meat. As a consequence, seabird populations (including storm-petrels) likely have been reduced (Hunt et al. 1980, Everett and Anderson 1991). Within its breeding range on the Pacific coast of the Californias, feral cats have existed on 16 islands (now 2) where Black Storm-Petrel might well have nested, rats on 9 (now 8), and dogs on 2 (McChesney and Tershey 1998, B. Tershey pers. comm.). Most substantial impact to cavity-nesting seabirds has occurred on islands <3 km^2 in area, in part (perhaps) explaining large Black Storm-Petrel population on the three (larger) Islas Los San Benitos (where cats once existed; McChesney and Tershey 1998).

Among the California Channel Islands, a recent problem may result from the immense increase in squid-fishing vessels near to shore during summer (H. Carter, U.S. Geol. Surv., Dixon Field Station CA). These boats, using very powerful lights (to attract squid), are spread densely over extensive areas near to island shores. In the lighted night sky, owl predation on small seabirds may be enhanced. No direct information exists on whether or not this activity effects Black Storm-Petrel, but it would be fairly easy to test

Management and Research Recommendations

Like all seabirds confined in nesting to offshore islands, the introduction of mammals, especially cats and rats, pose a continuous threat. Measures should be taken to guard against such introductions and to remove feral animals where they have been introduced (e.g. McChesney and Tershey 1998).

Persistence as a breeding species in Alta California, the extreme periphery of the population, depends greatly on health (population size, productivity) of the population at its center. Most potential emigrants that would establish new colonies or swell existing ones at the periphery will come from the central colonies. A genetic study of all the storm-petrel populations (island by island) from central Alta California to central Baja California should reveal the potential of various colonies to act as recruit "sources." In other words, results would reveal the degree to which colonies are isolated (e.g., Is Sutil Island offshore of Santa Barbara Island a separate colony in the case of the Black Storm-Petrel?).

In accord, some recent actions may enhance Black Storm-Petrel populations in Alta California. Rats have been eradicated from two potential breeding islands in Baja California, and eradication is underway at 6 other islands (including Anacapa; B.

Tershey, pers. comm.). Cats have been eradicated recently from 8 islands along Pacific coast of Baja California; rabbits and goats have been eradicated from Islas Los San Benitos; and goats and sheep from Islas Natividad.

Once the eradication of rats is completed on Anacapa Island, reintroduction of storm-petrels should be actively pursued. Playback recordings should be put in place in suitable habitat during the nesting season; storm-petrel feathers, which have a distinctive odor, could be collected elsewhere and scattered about. Efforts on behalf of Black Storm-Petrels should be included. It would be reasonable to induce colonization at other suitable island sites in southern California, given the northward increase of this species at sea in response to warmer temperatures and, in accord, the northward colonization of other subtropical coastal seabirds (see above).

Egg-shell thinning and reduced hatching success owing to elevated levels of DDT and PCB evident in Ashy Storm-Petrel at Santa Cruz Island (H. Carter pers. comm.). If true, the same problem could be affecting Black Storm-Petrel, which feeds even farther inshore (closer to pesticide source) than Ashy, at Islas Los Coronados and Channel Islands. Samples could be analyzed for contaminants to determine if a problem exists.

Storm-petrels are very sensitive to disturbance by humans (Ainley 1995, Huntington et al. 1996, Everett and Ainley 2001). In areas of suitable storm-petrel breeding habitat on the Channel Islands, tourists should be excluded during the storm-petrel breeding season.

Monitoring Needs

Well-designed capture-recapture studies should be repeated on all storm-petrel nesting islands at regular intervals (~ 10 years). Long-term data sets collected at sea also could be

analyzed to reveal trends within the larger population (e.g., Hyrenbach and Veit for southern California; Ainley, Allen, Keiper, Nevins, Spear for central California). Reintroduction (or introduction) of Black Storm-Petrel to Anacapa Island should be followed closely.

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